

The old times - Los viejos tiempos

History of the aeronautics: the balloon trip and the airship

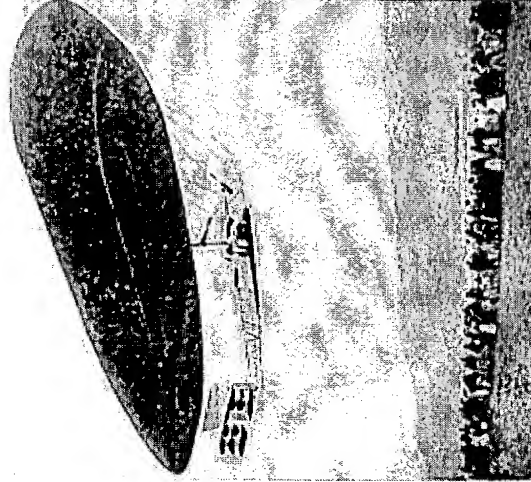
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The flexible airships and their gradual development .

In the beginnings of the XX Century there was another type of aerial vehicle that, although did not acquire the fame of the airplanes ,it was of great value for certain purposes; this one was the dirigible. The airship is the natural descendant of the spherical balloon, that was invented by two Parisian manufacturers of paper Joseph and Etienne Montgolfier, in 1783. The inventors filled their globes with hot air, which , naturally, cannot be used for trips longer than a few minutes of duration, because the air cools off. Sometime later, in the same year, the physicist M. Charles corrected this difficulty using hydrogen content in an envelope of varnished silk, and the form of the spherical balloon has not varied materially since then until now. It did not pass a year since then without several tests of construction of airships done , one of which, provided with great oars and governed with a rudder was completed successfully in time of calm. This was the work of the Robert brothers, who introduced a novelty, a characteristic that later formed a numerous dirigible class. A spherical balloon immovable respect to the air that surrounds it does not undergo pressures in the surface that unbalances it, and, by consequence, it can be left the interior in communication with the atmosphere.



Old photo taken to a flexible French airship, where it can be seen the great multitude observing its elevation .

Nevertheless, when it is wanted to advance the air resistance to this movement tends to compress

the balloon and it is necessary to resist this tendency, or constructing a rigid frame within the balloon, or closing the cover and making that the inner pressure of the balloon is slightly superior to the atmospheric one . To prevent any gas escape it is introduced in the cover a small globe (ballonet), or air chamber, and the pressure of the gas is regulated by the introduction in the ballonet of a greater amount of air or by the extraction of this gas. This was the artifice invented by the Robert brothers to maintain the form of their balloon .

In 1852, Enrique Giffard did a successful experiment with an airship, using a steam engine of three horsepower. It must be noticed that while in the United Kingdom almost all the inventors made their works on the dynamic flight, in France it was laid the foundations of the apparatuses lighter than the air. The following important advance was made by the captain Renard, whose airship La France, moved by an electrical motor, made numerous trips in 1884 and 1885, that demonstrated its good conditions of maneuverability and reached an average speed of 25 kilometers per hour in its different flights.

Towards the end of the XIX Century, the light gasoline motor became practicable for general use, and provided the same impulse to the airship that it had done to the airplane. Santos Dumont , the same Brazilian young man who made in Europe the first flight by airplane, was also the first one that was completely successful with a balloon equipped with a gasoline motor. He constructed a great number of airships, overcoming his difficulties one after one, and finally he won, in 1901, the Deutsch prize flying from the field of the Aero Club of France, then around the Eiffel tower, and returning to the starting point . His balloons, although excellent as sport novelties , did not have sufficient force or cargo capacity to be of great military value, and the inventor returned to his airplane, having contributed greatly to the world-wide knowledge of the airship. Later, increases in the size and improvements of detail were made , specially by the brothers Lebaudy and the commander Parseval in Germany; but little radically new has been added to the nonrigid dirigible of Santos Dumont .



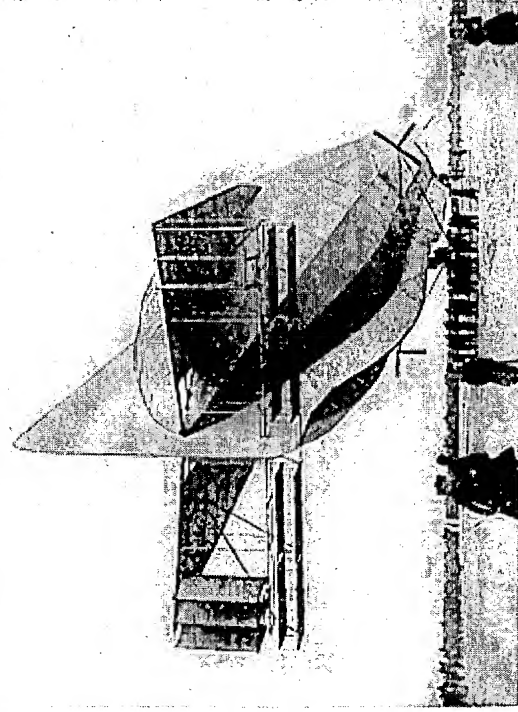
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Photo of the forced descent of the Zeppelin Z-4 in France.



The rigid Zeppelin dirigible and its military "record" .

Let us see now a radically different type of airship : the rigid airship. This is almost exclusively a fruit of the German works, and it was generally known by the public by the name "Zeppelin", that was the name of its German constructor.

The Count Ferdinand von Zeppelin (1838-1917), who was a military attaché of Germany in the Potomac army in 1863 (Civil War), where he made his first balloon ascent , was official in the Franco-Prussian war. After retiring of the active service, he began to be interested much in dirigibles, and finished the construction of the first devised by him in 1900. This, as all in the long series that followed it , was a true rigid balloon. The outer cover was extended on a complicated aluminum alloy frame. Within the frame there were numerous balloons (up to 17) that contained hydrogen. Under the frame there was suspended the nacelle that transported the passengers and motors. This system had the advantage that because of the reinforcement of the frame in the most demanding points, the balloon could travel to practically limitless speeds without fear that it would become deformed, and the subdivision of the gas containers prevented the total destruction if there was an accident in any compartment. The Zeppelin I had 32 horsepower and reached a speed of 38 kilometers per hour. It had passed five years before Zeppelin II was arranged to its tests. This model finished later with a fast disaster, because it was practically destroyed by a hurricane. Soon it became evident that an airship of such great dimensions (the Zeppelin II had 126 meters in length) required mooring facilities like those needed for a transatlantic

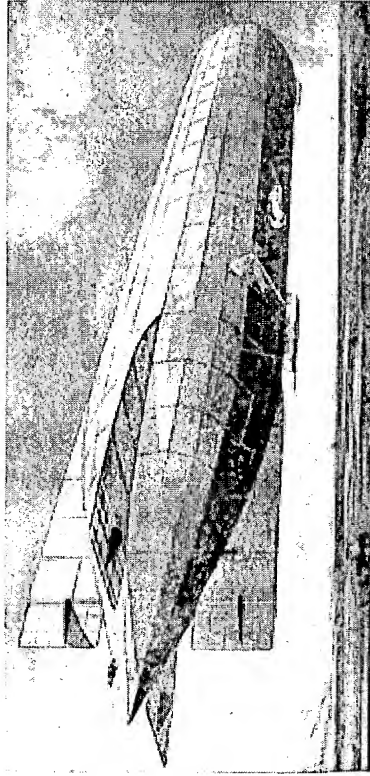


Image of the armed German **Zeppelin** . In the image can be seen the nacelles, one of the two propulsion "protrusions" , carrying its motor, machine gun and dynamo and the machine gun located in the stern.

The inventor later made diverse improvements in his apparatus, and in 1908 a military zeppelin made a trip of 432 kilometers at an average speed of 35 kilometers per hour. In 1910 a regular service of passengers between several German cities was implanted, that worked until exploding the World War I , being used it the zeppelins. The German government, anticipating the great military value of the invention supported the Count Zeppelin , who could follow his experiments, constructing, undoing, and returning to construct balloon after balloon without the economic difficulties that he had experienced in the beginnings.

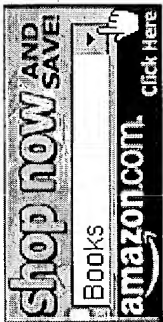
The German authorities trustily waited for great feats of the rigid airships applied to the war; but these apparatuses had not given all the awaited results . The zeppelins were able to transport heavy weights, and had the advantage of being able to locate themselves on any place; but being so great, they presented an excellent target to the artillery and had to remain at a considerable height by this cause. The war incursions on England were not used for any important military objective, and resulted solely in destruction of private property and the death of noncombatant.

The development in Italy of kite balloons and semi-rigid airships

During the World War I, the tremendous activity in the aeronautics extended to other countries , and the lighter than the air apparatuses gave origin to certain number of important inventions. Italy invented a kite balloon of almost spherical form that completely remained quiet with moderate winds. These balloons were used primarily for the observation, mainly for the fire control of artillery. They were tied to the ground by means of a cable and remained in the air as a kite.

The Italian engineers specialized during many years in the semi dirigibles ,

and is considered that in this specialty they had advanced more than any other country. It has been seen that these apparatuses adapted perfectly to the necessities of the Italians during the war, because they could move to high altitude, although they never were considered as a particularly fast type of aerial ship. The unfortunate Rome, bought by the United States in 1921, was the greatest airship of this type constructed in the world. It had 125 meters in length, with a capacity of 33,722 cubic meters of hydrogen, and completely loaded it weighed 38 tons, including ballast, fuel and provisions.



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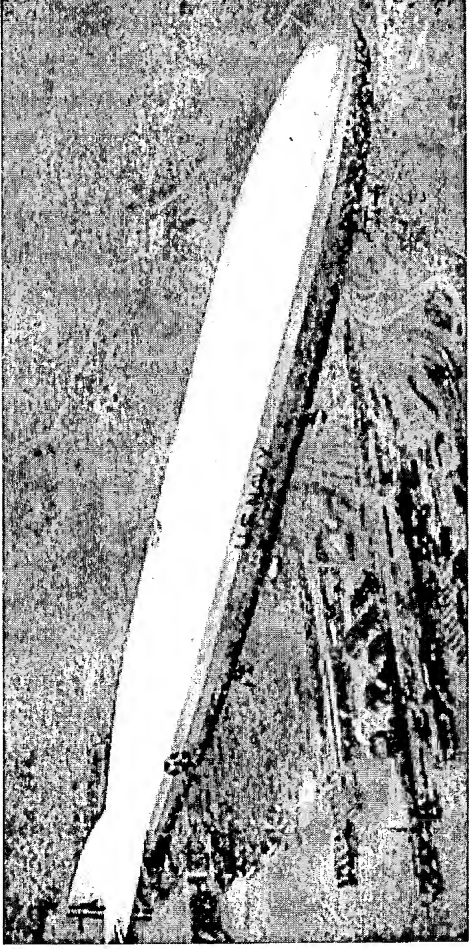
The terrible disasters of the "Rome" and the "ZR-2" and their causes.

The destruction of airship Rome, at the beginning of 1922, with the death of ten people, happened during its first trial flight , after the installation of the new Liberty motors that had replaced the primitively used Italian ones and that had not been satisfactory for the flight in the United States; and it was due to the inflammation of hydrogen, when hitting the ship a high tension cable when it was going to land because of a failure. In its first flights in the United States the helium was used to fill the "Rome"; but due to the shortage and difficulty to obtain the gas in sufficient amount to provide the gigantic airship, it had been replaced by hydrogen. The ZR-2, that was destroyed in one of the greater disasters ever known in the history of the aeronautics of beginnings of XX Century, when it made his final trip of test, before being accepted by the government of the United States, when falling over Hull, England, in 1920, differed from the "Rome" in that it had a rigid frame that extended throughout the inferior surface of the cover , what provided many of the advantages of a rigid airship with smaller weight. The ZR-2 had 213 meters in length and a capacity of 77,825 cubic meters of gas.

The catastrophe of the " Shenandoah " .

The catastrophe in which the Shenandoah was destroyed the September 3 , 1925, reached even more terrible proportions . By order of the U.S. Government it was ordered to the airship to make a trip to visit the fairs of some western States. Near Ava, Ohio, it was surrounded in a stormy burst, against which it fought laboriously during several hours, until it was divided in two pieces. The stern of the apparatus crashed against the ground, perishing the captain and 13 crew members. The prow, where lieutenant Rosendahl was , floated for a moment and could land without a loss of lives. Rosendahl later made a dramatic story of all the process of the catastrophe, that gave place to colonel Guillermo Mitchell blaming the military department and the Navy of the United States of "incompetence , criminal negligence and almost treasonous administration". The Shenandoah had 207.25 meters in length and weighed 37 tons. Its frame was of made duralumin , it was fed on helium and it was powered by six machines able to maintain the march of the apparatus during two days and two nights up to 90 kilometers per hour. It had cost 2,950,000 dollars and had already made 50,000 kilometers of airship navigation.

The airship
"Shenandoah", in the
heat of flight, before
the catastrophe.



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